

Amendments to the Claims

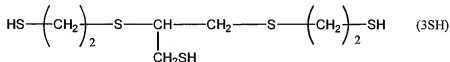
The following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Claims

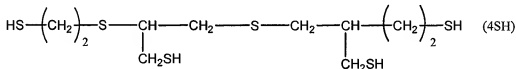
Claims 1-38 (canceled)

39. (currently amended) A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the three-dimensional matrix is a polythiourethane matrix or a polyepisulfide matrix.
40. (canceled)
41. (currently amended) The material of claim ~~[[40]]~~ 39, wherein the polythiourethane matrix is produced by means of a polyaddition reaction of a NCO end group-containing polythiourethane prepolymer with a SH end group-containing polythiourethane prepolymer.
42. (previously presented) The material of claim 41, wherein the NCO end group-containing polythiourethane prepolymer has a number average molecular weight ranging from 1000 to 2000.
43. (previously presented) The material of claim 41, wherein the NCO end group-containing polythiourethane prepolymer has a NCO/SH ratio from 4:1 to 30:1.
44. (previously presented) The material of claim 41, wherein the SH end group-containing polythiourethane prepolymer has a number average molecular weight ranging from 200 to 300.
45. (previously presented) The material of claim 41, wherein the SH end group-containing polythiourethane prepolymer has a SH/NCO ratio ranging from 4:1 to 30:1.

46. (previously presented) The material of claim 41, wherein the NCO end group-containing polythiourethane prepolymer and/or the SH end group-containing polythiourethane prepolymer results from the polyaddition of xylene diisocyanate and/or dimethyl norbornyl diisocyanate with polythiol of formula:



and/or



47. (previously presented) The material of claim 39, wherein antiplasticizing additive has an antiplasticization temperature in the range of temperatures from 0 to 85°C.
48. (previously presented) The material of claim 39, wherein the antiplasticizing additive has a solubility parameter δ_a , wherein:

$$\delta_{mo} - \delta_a < 5 \text{ MPa}^{1/2}$$

and δ_{mo} is a solubility parameter of polyisocyanate and polythiol monomers used to produce the matrix.

49. (previously presented) The material of claim 39, wherein the antiplasticizing additive has a solubility parameter δ_a , wherein:

$$\delta_{ma} - \delta_a > 4 \text{ MPa}^{1/2}$$

and δ_{ma} corresponds is a solubility parameter of the matrix.

50. (previously presented) The material of claim 39, wherein the antiplasticizing additive has a solubility parameter δ_a , wherein:

$$19 \leq \delta_a \leq 23.$$

51. (previously presented) The material of claim 39, wherein the antiplasticizing additive is a dialkyl sulfide, diaryl sulfide, dialkylaryl sulfide, alkylaryl sulfide, arylalkyl aryl sulfide, aryl alkylsilane sulfide, a compound containing a carbonyl group, S-arylthioalkylate, bis-arylthioalkyl, a compound containing a thiourea group, a compound containing a urethane group, or a compound containing a diurethane group.
52. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing agent additive comprises a sulfide of formula:

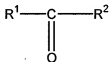


wherein R^1 and R^2 are independently an alkyl radical, a cycloalkyl radical, an aryl radical; an arylalkyl radical, a radical:



wherein R is an alkyl radical, or a trialkyl silane radical.

53. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing agent additive is a carbonyl group of formula:

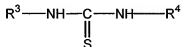


wherein R^1 and R^2 are independently an alkyl radical, a cycloalkyl radical, an aryl radical, an arylalkyl radical, a radical:



wherein R is an alkyl radical, or a trialkyl silane radical.

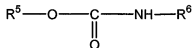
54. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing agent additive is a thiourea group of formula:



wherein R³ and R⁴ are independently an alkyl radical, a cycloalkyl radical, an alkyl radical bearing a nitrogen and/or an oxygen heterocycle.

55. (previously presented) The material of claim 54, wherein at least one of R³ and R⁴ is a C₁-C₁₂ alkyl radical, a 6-membered radical, or a 4-morpholinoalkyl radical.

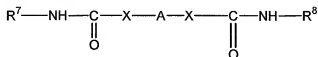
56. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing agent additive is a urethane group of formula:



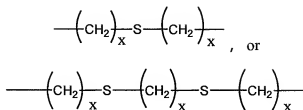
wherein R⁵ and R⁶ are independently a cycloalkyl group, a cycloalkyl alkyl group, an aryl group, or an arylalkyl group.

57. (previously presented) The material of claim 56, wherein at least one of R⁵ and R⁶ is a 6-membered radical, a cyclohexylalkyl group, a phenyl group, or a phenylpropyl group.

58. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing agent additive is a diurethane group of formula:

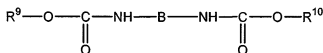


wherein A is a C₁-C₁₂ alkylene group,

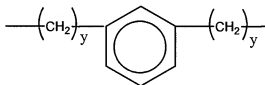


wherein x is an integer ranging from 1 to 6 and wherein X is -O- or -S- and R⁷ and R⁸ are independently a cycloalkyl group or aryl group.

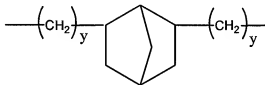
59. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing ~~agent~~ additive is a diurethane group of formula:



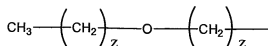
wherein B is a radical of formula:



or

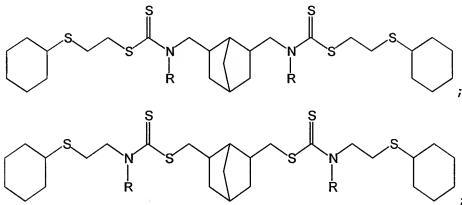


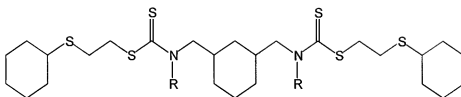
wherein y is an integer ranging from 1 to 4 and R⁹ and R¹⁰ are independently a cycloalkyl alkyl radical, an aryl (C₁-C₆)alkyl radical, a (bridged) cycloalkyl (C₁-C₆)alkyl radical, or an ether-oxide radical of formula:



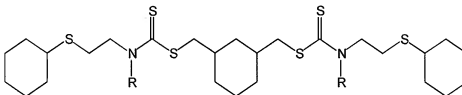
wherein z is an integer ranging from 1 to 4.

60. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing additive is dioctyl sulfide, benzyl and phenyl sulfide, dibenzyl sulfide, 4-(p-tolylthio)benzophenone, bis(phenylthio)methane, S-phenylthiopropionate, phenylthiomethyltrimethyl silane, 1-cyclohexyl-3-(2-morpholinoethyl)-2-thiourea, cyclohexylpropylcyclohexyl urethane, phenylpropylcyclohexyl-(octane diurethane), cyclohexylpropyl-cyclohexylpropylxylylene diurethane, cyclohexylethyl-cyclohexylethylxylylene diurethane, phenylpropyl-phenylmethane, propoxyethyl-propoxyethylxylylene diurethane, norbornanemethyl-norbornanemethylxylylene diurethane, phenylpropyl-phenylpropylxylylene diurethane, cyclohexyl-cyclohexyl (thiodiethane di-S-thiourethane), phenyl-phenyl (thiodiethane di-S-thiourethane), cyclohexyl-cyclohexyl (dithiaoctane diurethane), cyclohexylpropyl-cyclohexylpropyl dimethyl norbornane diurethane, cyclohexylethyl-cyclohexylethyldimethyl norbornane diurethane, propoxyethyl-propoxyethyldimethyl norbornane diurethane, norbornanemethyl-norbornanemethyldimethyl norbornane diurethane, phenylpropyl-phenylpropyl-dimethyl norbornane diurethane, cyclohexyl-cyclohexyl (thiodiethane diurethane), or phenyl-phenyl (thiodiethane diurethane).
61. (currently amended) ~~The material of claim 51~~ A thermoset plastic material comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix, wherein the antiplasticizing additive has one of the formulae:





or



wherein R is H, an alkyl group, or an aryl group.

62. (previously presented) The material of claim 39, wherein the antiplasticizing additive is present in amount ranging from 5 to 25% by weight of the total weight of the matrix.
63. (previously presented) The material of claim 62, wherein the antiplasticizing additive is present in amount ranging from 5 to 15% by weight of the total weight of the matrix.
64. (previously presented) The material of claim 39, wherein the matrix is producible by polyaddition of at least one polyisocyanate and at least one polythiol.
65. (previously presented) The material of claim 64, wherein the polyisocyanate is a diisocyanate.
66. (previously presented) The material of claim 64, wherein the polythiol is a tri- or tetrathiol.
67. (previously presented) The material of claim 64, wherein the polyisocyanate is an aromatic polyisocyanate, aliphatic polyisocyanate, or cycloaliphatic polyisocyanate.
68. (previously presented) The material of claim 67, wherein the polyisocyanate is phenylene diisocyanate, ethylphenylene diisocyanate, isopropylphenylene diisocyanate, dimethylphenylene diisocyanate, diethylphenylene diisocyanate, diisopropylphenylene

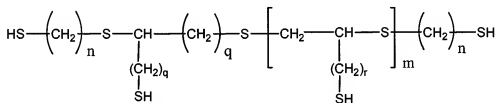
diisocyanate, trimethylbenzyl triisocyanate, xylylene diisocyanate (XDI), benzyl triisocyanate, 4,4'-diphenylmethanediisocyanate and isophorone diisocyanate, hexamethylene diisocyanate, bis(isocyanate)methyl cyclohexane, dicyclohexyl methane diisocyanate, dimethyl norbornyl diisocyanate (NDI), or norbornyl methyl diisocyanate.

69. (previously presented) The material of claim 64, wherein the polythiol is:



wherein R' is an organic group the valence of which corresponds to n'; where n' is an integer ranging from 2 to 6.

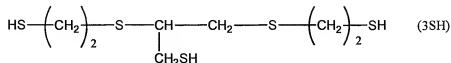
70. (previously presented) The material of claim 69, wherein the polythiol has following formula:



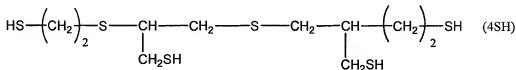
wherein n is an integer ranging from 1 to 4, p, q and r are integers ranging from 1 to 4, and m is the integer 1 or 2.

71. (previously presented) The material of claim 70, wherein the polythiol is pentaerythritol tetrakis mercaptopropionate, 1-(1'-mercaptoethylthio)-2,3-dimercapto propane, 1-(2'-mercaptopropylthio)-2,3-dimercapto propane, 1-(3'-mercaptopropylthio)-2,3-dimercapto propane, 1-(4'-mercaptobutylthio)-2,3-dimercapto propane, 1-(5'-mercaptopentylthio)-2,3-dimercapto propane, 1-(6'-mercaptohexylthio)-2,3-dimercapto propane, 1,2-bis(4'-mercaptobutylthio)-3,mercapto propane, 1,2-bis(6'-mercaptohexyl)-3-mercapto propane, 1,2,3-tris(mercaptomethylthio)propane, 1,2,3-tris(3'-mercaptopropylthio) propane, 1,2,3-tris(2'-mercaptoethylthio)propane, 1,2,3-tris(4'-mercaptobutylthio)propane, 1,2,3-tris(6'-mercaptohexylthio)propane, 1,6-hexanethiol-1,2,3-propanetriitol, or 1,2-bis(2'-mercaptoethylthio)-3-mercapto propane.

72. (previously presented) The material of claim 71, wherein the polythiol has following formula:



or



73. (previously presented) The material of claim 39, further defined as having a phase separation.
74. (previously presented) The material of claim 73, further defined as having a nanophase separation.
75. (previously presented) The material of claim 39, further defined as having an energy release ratio G_{IC} of at least 0.15 kJ.m^{-2} .
76. (previously presented) An ophthalmic lens comprising an optically transparent, thermoset plastic material, comprising a three-dimensional polymer matrix, the loss modulus (E'') of which presents a secondary glass transition (β), and at least one antiplasticizing additive.
77. (previously presented) The ophthalmic lens of claim 76, wherein the thermoset material has a nanophase separation.
78. (previously presented) The ophthalmic lens of claim 76, wherein the matrix is a polyurethane matrix or a matrix producible by polymerizing a composition comprising at least one polyepisulfide.

79. (previously presented) The ophthalmic lens of claim 76, wherein the antiplasticizing additive has a solubility parameter δ_a and:

$$\delta_{mo} - \delta_a < 5 \text{ MPa}^{1/2}$$

wherein δ_{mo} corresponds to the solubility parameter of polyisocyanate and polythiol monomers used to produce the polythiourethane matrix.

80. (previously presented) The ophthalmic lens of claim 76, wherein the antiplasticizing additive has a solubility parameter δ_a and:

$$\delta_{ma} - \delta_a > 4 \text{ MPa}^{1/2}$$

wherein δ_{ma} corresponds to the solubility parameter of the matrix.

81. (previously presented) The ophthalmic lens of claim 76, wherein the thermoset material comprises a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix.

82. (currently amended) A method of making an ophthalmic lens comprising:

obtaining a thermoset plastic material ~~of claim 39, comprising a three-dimensional matrix containing sulphur atoms and at least one antiplasticizing additive that does not react with said matrix;~~ and

using the material to form a lens.